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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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			EXAMINER	
			PHU, PHUONG M	
			ART UNIT	PAPER NUMBER
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DATE MAILED: 08/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,183

Applicant(s)

PIIRAINEN, OLLI

Examiner

Phuong Phu

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2002.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-10 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-5 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 3 recite the limitation "the channel equalizer" (on line 9 of claim 1 and line 2, claim 3). This limitation is lack of antecedent basis.

Claim 3 recites the limitation "the biasing" on line 3. This limitation is lack of antecedent basis.

Claim 9 recites the limitation "the Viterbi algorithm". This limitation is lack of antecedent basis.

Dependent claims (if any) of above claims are therefore also rejected.

3. Claims 1-5 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01.

Claim 1 omit step(s) showing functional/structural/connectional interrelationships of steps "estimating impulse response", "determining noise power by estimating a covariance matrix ...", "calculating tap coefficients ...", "determining the noise power...", and "weighting input signals...", to one another, in order to make the "radio receiver" being implemented with the claimed "channel equalization" method as a complete operative/connective system.

Claim 1 omits steps showing functional/structural/connectional interrelationships of recited elements “prefilters”, “equalizer” and “channel equalizer” to one another in order to make the “radio receiver” being implemented with the claimed “channel equalization” method as a complete operative/connective system.

Claim 1 recites the limitation “estimating impulse response” on line 3. It is unclear of which elements/parameters (recited in claim) the “impulse response” is estimated under the process “estimating impulse response”. It appears that the limitation should be changed to -- estimating a channel impulse response of a received signal in the channel equalization--.

Claim 1 recites the limitation “prefiltering” on line 5. It is unclear whether the “prefiltering” performs its process on the “received signal” (previously recited on line 5).

Claim 1 recites the limitation “prefiltering” on line 7. It is unclear whether it refers to the limitation “prefiltering” previously recited on line 5.

Claim 1 recites the limitation “estimating a noise variance” on line 7 and 8. It is unclear of which elements/parameters (recited in claim) the “noise variance” is estimated under the process “estimating a noise variance”.

Claims 1 and 3 recited the limitation “coefficients” (on lines 9-10 of claim 1 and line 2 of claim 3). It is unclear whether it refers to the limitation “coefficients” previously recited on line 6 of claim 1.

Claim 2 recites the limitation “means of noise covariance matrix estimate” on line 2 and 3. It is unclear whether this limitation has any interrelationship with step “estimating a covariance matrix of the noise contained in a received signal”, previously recited on lines 4 and 5 of claim 1.

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Dependent claims (if any) of above claims are therefore also rejected.

4. Claims 6-10 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

Claim 6 omits showing functional/structural/connectional interrelationships of “prefilter”, “channel equalizer”, “means for estimating an impulse response”, “means for determining noise power of a received signal...”, “means for calculating tap coefficients ...”, “means for determining the noise power after filtering...”, “means for weighting input signals...” to one another in order to make the claimed radio receiver as a complete operative/connective system.

Claim 6 recites the limitation “estimating impulse response”. It is unclear of which elements/parameters (recited in claim) the “impulse response” is estimated under the process “estimating impulse response”.

Claim 6 recites the limitation “prefiltering” on line 5. It is unclear whether the “prefiltering” performs its process on the “received signal” (previously recited on line 4).

Claim 6 recites the limitation “estimating a noise variance”. It is unclear of which elements/parameters (recited in claim) the “noise variance” is estimated under the process “estimating a noise variance”.

Claims 6 and 8 recited the limitation “coefficients” (on lines 11 of claim 6 and line 3 of claim 3). It is unclear whether it refers to the limitation “coefficients” previously recited on line 6 of claim 6.

Claim 7 recites the limitation “means of noise covariance matrix estimate” on line 2 and 3. It is unclear whether this limitation has any interrelationship with the limitation “estimating a covariance matrix of the noise contained in a received signal”, previously recited on lines 3 and 4 of claim 6.

Claim 7 omits showing functional/structural/connectional interrelationships of “means of noise covariance matrix estimate” (recited on lines 2-3) with other previously-cited elements, e.g., “prefilter”, “channel equalizer”, “means for estimating an impulse response”, “means for determining noise power of a received signal...”, “means for calculating tap coefficients ...”, “means for determining the noise power after filtering...”, “means for weighting input signals...”, etc.

Claim 8 omits showing functional/structural/connectional interrelationships of “means for weighting the signals ...” (recited on lines 2-4) with other elements, e.g., “prefilter”, “channel equalizer”, “means for estimating an impulse response”, “means for determining noise power of a received signal...”, “means for calculating tap coefficients ...”, “means for determining the noise power after filtering...”, “means for weighting input signals...”, etc, previously recited on claim 6.

Claim 9 omits showing functional/structural/connectional interrelationships of “means for carrying out channel equalization” and “a channel equalizer” with other elements, e.g., “prefilter”, “channel equalizer”, “means for estimating an impulse response”, “means for determining noise power of a received signal...”, “means for calculating tap coefficients ...”, “means for determining the noise power after filtering...”, “means for weighting input signals...”, etc., previously recited on claim 6.

Claim 10 omits showing functional/structural/connectional interrelationships of “means for carrying out channel equalization” and “a decision feedback channel equalizer” with other elements, e.g., “prefilter”, “channel equalizer”, “means for estimating an impulse response”, “means for determining noise power of a received signal...”, “means for calculating tap coefficients ...”, “means for determining the noise power after filtering...”, “means for weighting input signals...”, etc., previously recited on claim 6.

Dependent claims (if any) of above claims are therefore also rejected.

Conclusion

5. References (6,535,554), (6,151,358), (6,724,841), (5,303,263) and (5,432,816) are cited because they are pertinent to the claimed method/system.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong Phu whose telephone number is 703-308-0158. The examiner can normally be reached on M-F (8:30-6:00) First Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 703-306-3034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Phuong Phu

Phuong Phu
08/19/04

Phuong Phu
Primary Examiner
Art Unit 2631

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PRIMARY EXAMINER